

ABSTRACT

An automatic matching and tuning unit (AMTU), which connects the output from a low or medium frequency, high power radio transmitter, which requires a 50 ohm terminating impedance, to an antenna with an input impedance comprising low resistance in series with a high capacitive reactance. Sensors measure the phase angle between the input current and voltage. The inductance of a series connected loading coil is continuously varied to resonate the antenna capacitance. The resulting input resistance is transformed to 50 ohms using a matching transformer and pair of resonant, mutually coupled coils with adjustable mutual coupling. Sensors measure the input resistance and continuously adjust the mutual coupling coefficient to maintain the required 50 ohm input impedance. Sensors measure the antenna current and vary the transmitter power level to keep it constant. A microcontroller processes all of the sensor outputs and provides serial communication with the transmitter.